WE CLAIM AS OUR INVENTION:

1. A device for measuring an ionizing radiation dosage comprising:

a foil-like carrier; and

a ionizing radiation absorption structure disposed on said foil-like carrier, said absorption structure comprising a plurality of thin-film layers disposed one above another and forming at least one thin-film diode structure that supplies an output signal dependent on ionizing radiation incident on said absorption structure.

2. A device as claimed in claim 1 wherein said diode structure comprises two film electrodes and a photo-active semiconductor film layer disposed between said two film electrodes.

3. A device as claimed in claim 2 wherein said photo-active semiconductor film layer is comprised of at least one organic semiconductor.

4. A device as claimed in claim 3 wherein said photo-active semiconductor film layer is comprised of at least one organic semiconductor functioning as a donor, and an additional material functioning as an acceptor.

5. A device as claimed in claim 2 wherein said photo-active semiconductor film layer is comprised of two different semiconductors forming a heterojunction diode structure.

6. A device as claimed in claim 5 wherein said semiconductor film layer is formed by a first sub-layer comprised of a first of said two different semiconductors, and a second sub-layer comprised of a second of said two different semiconductors, said first and second sub-layers forming a heterojunction.

7. A device as claimed in claim 5 wherein said photo-active semiconductor film layer is comprised of a mixture of said two different

semiconductors, forming a plurality of heterojunctions in said semiconductor film layer.

8. A device as claimed in claim 3 wherein said photo-active semiconductor film layer is comprised of a p-doped first sub-layer and an n-doped second sub-layer, forming a pn-junction.

9. A device as claimed in claim 3 wherein said organic semiconductor material is selected from the group consisting of semiconducting conjugate polymers, derivatives of semiconducting conjugate polymers, low molecular weight semiconductors, and plastics selected from the group consisting of monomers, oligomers and polymers.

10. A device as claimed in claim 2 wherein at least one of said thin film electrodes is comprised of a material selected from the group consisting of conductive polymers, doped polymers, metals, metal alloys, metal oxides and alloy oxides.

11. A device as claimed in claim 1 wherein said foil-like carrier is comprised of a material selected from the group consisting of plastic and glass.

12. A device as claimed in claim 1 wherein said absorption structure comprises a scintillator.

13. A device as claimed in claim 1 wherein said diode structure is comprised of two film electrodes and a photo-active semiconductor film layer disposed between said two film electrodes, and wherein said scintillator is applied to one of said film electrodes as a thin-film scintillator layer.

14. A device as claimed in claim 12 wherein said diode structure comprises two film electrodes and a photo-active semiconductor film layer disposed between

said two film electrodes, and wherein said scintillator is integrated into one of the film electrodes.

15. A device as claimed in claim 12 wherein said diode structure comprises two film electrodes and a photo-active semiconductor film layer disposed between said two film electrodes, and wherein said scintillator is integrated into the photo-active semiconductor film layer.

16. A device as claimed in claim 1 wherein said diode structure comprises two film electrodes and a photo-active semiconductor film layer disposed between said two film electrodes, and wherein said photo-active semiconductor film layer has a thickness of less than or equal to μm.

17. A device as claimed in claim 16 wherein said photo-active semiconductor film layer has a thickness that is less than or equal to 1 μm.

18. A device as claimed in claim 1 wherein said diode structure comprises two film electrodes and a photo-active semiconductor film layer disposed between said two film electrodes, and wherein at least one of said film electrodes has a thickness of less than equal to 2 μm.

19. A device as claimed in claim 18 wherein at least one of said film electrodes has a thickness of less than or equal to 1 μm.

20. A device as claimed in claim 1 wherein said absorption structure comprises a plurality of layers applied by an application technique selected from the group consisting of thermal vaporizations, cathode sputtering, solution centrifuging, and printing.

21. A device as claimed in claim 1 wherein said absorption structure is a first absorption structure, and comprising a plurality of further absorption structures disposed in said foil-like carrier.

22. A device as claimed in claim 21 wherein said first absorption structure and said plurality of further absorption structures are distributed on said foil-like carrier in a matrix-like arrangement.

23. A device as claimed in claim 1 comprising a radiation detector on which said foil-like carrier is disposed, with said foil-like carrier and said absorption structure and said radiation detector forming a common, unitary component.

24. A device as claimed in claim 23 wherein said radiation detector is a solid-state radiation detector.

25. A radiation image acquisition apparatus comprising:

a radiation source that emits ionizing radiation;

a radiation detector disposed in a path of said ionizing radiation; and

a device disposed in said ionizing radiation for measuring a dose of said ionizing radiation, comprising a foil-like carrier, and a ionizing radiation absorption structure disposed on said foil-like carrier, said absorption structure comprising a plurality of thin-film layers disposed one above another and forming at least one thin-film diode structure that supplies an output signal dependent on ionizing radiation incident on said absorption structure.